Fusion-Forty

The Amiga 68040 accelerator board

RCS MANAGEMENT

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INTRODUCTION

The Fusion-Forty card is an accelerator for the Amiga 2000 family of Commodore computers. The Fusion-Forty board with the Motorola 68040 microprocessor running at 25Mhz raises the Amiga to a new dimension of performance. Installed in an Amiga 2000, the Fusion-Forty provides much more computing power than the Amiga 3000. The Built in Floating Point Unit (FPU) in the Motorola 68040 vastly increases the performance of complex math calculations.

The Fusion-Forty is especially valuable to people who do rendering or ray tracing where many complex calculations are needed to generate an image.

FEATURES

- A unique asynchronous design ensures GenLock compatibility.

- Built-in Math Coprocessor, Built-in Memory Managment Unit

- Code Compatability with all erlier MC68000 Processors.

- Hardware select switch to enable or disable 68040 mode and run original 68000 processor.

- Sockets for the addition of 4MB, 8MB, 16MB, 20MB, or 32MB of 32 bit memory. By installing proper memory chips in these sockets plus the 8MB of Fast RAM support by the system, you can expand the amount of Fast RAM to a total of 40MB.

- A heat sink is mounted on the Motorola 68040 microprocessor to dissipate the heat. This is the recommended way to cool the 68040 as specified by Motorola.

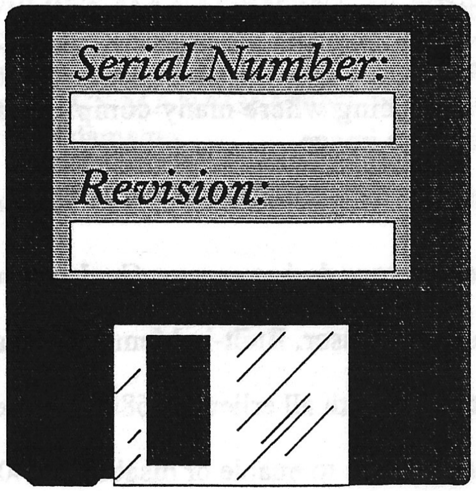
- Users should expect between twice to ten times the performance of the Amiga 3000.

- Fully compatible with Workbench 1.3 and 2.0.

WHAT COMES WITH YOUR FUSION-FORTY

Make sure you have received the following items:

- A Fusion-Forty Manual
- Installation software disk, including the install programs and operation programs.
- A Fusion-Forty board with amount of RAM specified on the box.
- A warranty registration card.



The contents of the Install Disk;

```
FUSION-FORTY:memory (dir)
  add_32meg                          add_4meg
  add_8meg                           add_F16meg
  add_F20meg                         ff_our_mem

FUSION-FORTY:
  append_f40                         cache_control
  Cache_Control.info                 Disk.info
  engage_fusion_forty                ff_ccache
  ff_dic                             ff_dtt0
  ff_fpsp_main                       ff_installfp
  ff_install_dram                    ff_movessp
  ff_remap_rom                       ff_vbr
  Install_Dram                       Install_Dram.info
  Install_Fusion_Forty               Install_Fusion_Forty.info
  m256.txt                           rcs_fusion_forty
  setpatch                           start_fusion_forty
```

INSTALLING THE FUSION-FORTY BOARD

NOTE: *This guide is intended for those who are already familiar with the Amiga and with the installation of hardware devices. If you are not familiar with hardware installation, please contact your local Commodore Amiga Dealer.*

Please take the time to read through this manual before installing the Fusion-Forty board.

WARNING: *Unplug the Amiga and disconnect all peripherals before installing the Fusion-Forty board. Installing the Fusion-Forty board with the power on could result in bodily injury and damage to the equipment. RCS MANAGEMENT will not be responsible for any injuries or damages caused by improper installation of the Fusion-Forty board and this action will void all warranties.*

"NEVER OPEN A COMPUTER WHILE POWER IS CONNECTED"

The Steps in installation are:

1) Disconnect the power cord and disconnect all peripherals.

2) Remove the four screws on the lower side of the Amiga and one centre screw from the top rear of the Amiga. Once the screws are removed, turn the Amiga so that you are facing the front of the machine. Grasp the cover and slide it towards you and lift up and away from the computer. If the cover seems stuck, check if any wires or cables are caught on the cover. Gently untangle anything that might be caught, and continue to slide the cover off.

3) The Fusion-Forty board must be inserted into the CPU slot. Find the CPU slot which is the closest to the power supply and the drive bays.

4) Locate and remove the two metal slot covers (four screws) at the back of the Amiga. These two metal slots are the ones closest to the power supply. [Note: one slot is for air flow]

5) If any cables (Hard drive SCSI, Floppy cables from a Bridgeboard, etc.) are running from a card currently in your unit to the amiga drive bays, remove them. If a Hardcard (Hard drive controller with a hard drive mounted on it) is in the first slot, this will usually have to be moved back a slot. Please refer to your hard drive manual for removing & replacing the controller.

6) Position the Fusion-Forty board so that the component (chips) side of the board faces away from the power supply.

7) Tilt the Fusion-Forty board so that the hardware select switch goes through the second slot (away from the power supply) area at the back. Align the front edge of the card with the plastic groove inside the front of the Amiga. Make sure the card does not snag any cables. Press down on the board at both ends while applying a slight end to end rocking motion to insert the board into the slot. Secure the Fusion-Forty board to the back of the Amiga with the two screws.

8) Replace any cables removed in step 5.

9) Replace the cover on the computer and put all screws back in.

10) Re-connect the power cord and peripherals.

11) Toggle the switch at the back of the Fusion-Forty to "68000" mode (Away from the red dot.) Power up the machine as usual.

INSTALLING THE SOFTWARE

The Fusion-Forty diskette provided completely automates all the software installation and gives the user full control over the options. These options include turning "on" and "off" of the data cache, the instruction cache and the copyback mode of the Motorola 68040 microprocessor. For instance, copyback mode must be turned off when launching a new program under Workbench 1.3. Another example is that the data cache must be turned off for some hard drive controllers.

It is recommended to back up your boot up disk before installing the Fusion-Forty software.

NOTE: *For those who have the command SETCPU in the startup-sequence. please remove it or else it will cause a system failure.*

The steps to install the Fusion-Forty software:

1) Power off the system.

2) Put the switch at the back of the Fusion-Forty to "68000" mode (Away form the red dot) position.

3) Boot the system as usual. Insert the Fusion-Forty diskette in any floppy drive.

4) Open the Fusion-Forty disk by double clicking on the disk icon.

5) In the window that appears, double click on the "Install-Fusion-Forty" icon.

6) Choose the "Proceed" button when everything is ready.

7) Click the "Install Fusion Forty" button to start installation.

8) Choose memory configuration as installed on the Fusion-Forty only. This is marked on the outside end of your box.

9) If you decide to modify the startup-sequence yourself. Please add the line "Engage_Fusion_Forty" to the FIRST line in your starup-sequence.

10) Turn the power off, and put the switch at the back to Fusion-Forty mode (Towards the red dot), turn power on.

The installation program assumes that the present system drive call SYS: is your boot disk and has a C and S directories. Also in the S directory a file exists called startup-sequence and that this file is executed on startup.

The installation program automatically copies all set-up files for the Fusion-Forty into your boot drive, and incorporates them into the startup-sequence.

No permanent changes are made to your disk. The Fusion-Forty software may be removed at any time, by re-running the "Install_Fusion_Forty" program and selecting the "Reverse Install Process" button.

WARNING: *If your C and S directories are assigned to another disk beside your boot disk, please re-assign them back to your boot up disk before proceed the installing process of the Fusion-Forty.*

INSTALLING ADDITIONAL RAM ON FUSION-FORTY

The Fusion-Forty board allows five different fast RAM configurations on board. Fast RAM is different from chip RAM. Fast RAM is not affected by the DMA activity of the Amiga's co-processor chips (graphic chips set). The stock Amiga 2000 comes with 1MB of chip RAM, which under heavy graphics load slows down the CPU considerably. Using fast RAM can speed up certain applications significantly.

The Fusion-Forty board uses page mode DRAM in a SIMM configuration. On the board there are 8 sockets for the DRAM expansion. The first four sockets closest to the 68040 microprocessor are called the lower bank, and the next four sockets are called the upper bank.

(See Fig 1 / DRAM Installation)

It is essential that the correct type of DRAM chips are installed. The required specifications are:

- 1 Megabit X 8 SIMM modules.

- 4 Megabit X 8 SIMM modules.

SIMM Specifications:
  - 80 ns average access time, or Faster
  - Page Mode Access
  - 15 ns CAH
  - 35 ns TAS

The Fusion-Forty board always comes with at least 4 Megabytes of RAM installed in the lower bank. To change the RAM configuration refer to the DRAM Installation page (fig 1). Obtain the required type and amount of SIMMS needed. Preferably purchase the same brand and speed as the ones currently on the board.

You can purchase upgrade RAM module kits directly from RCS MANAGEMENT, or your local dealer / distributor.

Steps to install the DRAM module

WARNING: *Do not install RAM modules unless you are experienced in these matters. The RAM modules are static sensitive, and require care in handling. Contact your local dealer for installation. RCS MANAGEMENT will not be responsible for any injuries or damages caused by improper installation of the DRAM.*

NOTE: *WARRANTY WILL BE VOID IF ANY CHANGE ON THE FUSION-FORTY BOARD IS NOT PERFORMED BY AUTHORIZED SERVICE PERSONNEL (LOCAL DEALERS SHOULD HAVE SUCH AUTHORIZATION)*

"NEVER OPEN A COMPUTER WHILE POWER IS CONNECTED"

1) Disconnect the power cord and disconnect all peripherals.

2) Remove the four screws on the lower side of the Amiga and one centre screw from the top rear of the Amiga. Once the screws are removed, turn the Amiga so that you are facing the front of the machine. Grasp the cover and slide it towards you and lift up and away from the computer. If the cover seems stuck, check if any wires or cables are caught on the cover. Gently untangle anything that might be caught, and continue to slide the cover off.

3) Remove the two screws holding the end of the Fusion-Forty board to the back of the Amiga.

4) Carefully remove the Fusion-Forty board from the CPU slot.

5) Make sure the front of the RAM module is facing toward the 68040 microprocessor. Gently slide each RAM module in the groove until the bottom edge of the SIMM is completely covered by the socket. Fill the RAM sockets according to the diagram in figure 1.

6) Replace the Fusion-Forty board into the CPU slot. (see Installing the Fusion-Forty section)
7) Replace the two screws holding the Fusion-Forty board to the back of the Amiga.

8) Slide the cover back on the Amiga.

9) Replace the screws attaching the cover to the Amiga.

10) Power on the machine.

11) Click on the "Install_Dram" icon, choose the amount of DRAM now installed on Fusion-Forty board.

12) Reboot the system.

ENABLE/DISABLE THE 68040 MODE

We are sure that most of you would like to boot under the 68040 mode for most operations. As the software market for the 68040 in the Amiga matures, more software will work with, and take advantage of the features of the 68040. Currently some software might not run under the 68040 (though our experience is that 90% of commercially available software will run without any modifications.) For this reason the Fusion-Forty board is equipped with a hardware switch at the back of the card to enable or disable the 68040 mode.

Enable the 68040 mode

1. Power off the system.
2. Move the switch towards the red dot at the back of the Fusion-Forty card.
3. Power on the system, 68040 mode is now engaged.

Disable the 68040 mode

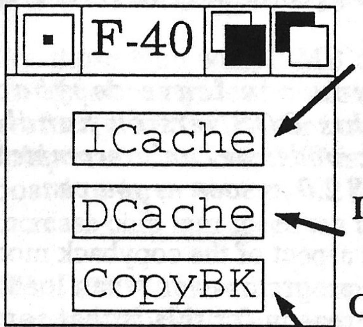
1. Power off system.
2. Move the switch away from the red dot at the back of Fusion-Forty card.
3. Power on the system, 68000 mode is now on.

NOTE: *When in 68000 mode, none of the Fusion-Forties features are accessible. For example the 32Bit memory will not be accessible to the 68000 processor.*

WARNING: *All Disk Activity Should Be Ceased Before Switching Modes, and the Power Turned OFF. Please wait 30 seconds before turning the power back on.*

CACHE CONTROL

Caching is controlled by the Cache Control Program. The following options can be turned On, or Off, by clicking the appropreate button. (See Fig 2, Below)



(Fig 2.)

Instruction Cache: In general this cache may be on at all times and will not interfere with any normal Amiga operation. By nature of instruction processing copyback has no effect on this cache.

Data Cache: In general this cache may be on at all times.

Copyback mode: Special operating mode will cause a massive increase in performance. But will also cause cache coherency problems. (Never start loading any program while copyback mode is on under 1.3.)

Once run, the cache control program turns on the Data and Instruction caches. Once you have selected your cache options; **don't close the window since it will turn OFF all caches** before leaving and return you to the safest but slowest 68040 mode. The reason we do this is because if you can't see your cache modes, you could inadvertently crash your machine in running a task under AmigaDOS 1.3. We decided that if you can't see it, it is then all OFF. This is unfortunately the slowest possible mode of the Fusion-Forty, it is also the safest and don't worry; in this mode you are still around twice as fast as a 25MHz 68030.

NOTE: *The instruction cache operates independently of the data cache. One, or both may be on or off at anytime.*

The only option that you need to pay special attention to is the "copyback" mode. On AmigaDOS 1.3 you must have copyback mode OFF each time you load a program, once it is loaded you can turn it ON again.

Data (Text, Graphics, Sound, Etc.) on the other hand can be loaded with "copyback" mode turned on.

You could then ask why have it ON at all if it causes problem(s), well it is because it will bring your performance to around 3.5 times a 68030 at 25 MHz.

Note: *On the AmigaDOS 2.0 you can leave copyback permanently ON, since this DOS version handles properly the 68040 copyback mode; we can't recommend you enough to get AmigaDOS 2.0 as soon as you can.*

You have also to consider the hidden aspect of the copyback mode option under AmigaDOS 1.3, some programs even when loaded can cause you some problems; the reason for this is that some programs are running background task(s) to accomplish some of their work, and if one of those task is loaded while copyback mode is ON you will have a visit with the guru!

As an example of this type of program there is Imagine from Impulse, whitch will load code from the hard drive. Upon Printing from Pagestream (From SoftLogik) a separate program is run.

The reason that programs, or you, cannot load and run software in copyback mode is that the caches are not coherent with the memory content they represent.

It does not mean that you can't use these programs under AmigaDOS 1.3 (in fact we are using Pagestream for writing this manual.), it just means that you have to be aware of when the copyback mode must be turned OFF. As a matter of fact Pagestream is one of the most improved in speed with the Fusion-Forty! (Up to 20 times faster then the Amiga 3000 on scaling a picture.)

HARDWARE CONSIDERATIONS

The Fusion-Forty's hardware compatibility is over 95%.

The famous Video Toaster from Newtek works very well with the Fusion-Forty and so does a long list of hardware devices, we don't give a list because of the great length.

For those who want 2 MB of chip RAM, we have tried some of the third party devices for the Amiga 2000 and they worked perfectly well with our board. Shortly RCS will announce the "chip ram accelerator". This product will allow your Fusion-Forty board to have access to 2MB of true 32Bit chip ram, and will increase chip ram speed ten times. (around 20MB per second!)

With all the new hardware coming out for the Amiga, it is becoming virtually impossible to try all combinations of hardware configurations with our Fusion-Forty; if you ever experience any problems please let us know your configuration and we will promptly find a solution. (See Technical Support section)

We have done our best to follow Motorola's and Commodore's specifications so you should not experience any problems with your actual configuration, we however already know some products that are not 100% compatible with your Fusion-Forty:

- The DCTV device from Digital Créations works perfectly in every aspect except that it won't digitalize picture because of a timing loop problem. Digital Creations is aware of the problem and will come with a software upgrade to solve it.

- The ASDG program for the JX series of scanners (JX100, JX450, etc.) is experiencing some problem, it will execute the black & white preview mode but will cause a software failure on the color mode; this is due to some program confusion with memory over the 9 MB limit, we are getting in contact with ASDG to find a solution. Since the black & white mode works, it means that the problem is strictly software.

HARD DRIVE CONSIDERATIONS

NOTE: *The hard disk controllers give different performance than on the 68000 based Amiga, some are better and yes some are not as good!*

- Hard disk controllers offer different levels of performance with the Fusion-Forty, the only one really creating problems to our knowledge is the one from Microbotics, where you have to turn off the "Data Cache" (see Software Considerations section) in order for it to function at all; this is unfortunately a solution that diminishes the performance of the Fusion-Forty.

- For the Commodore A2091 it is recommended to use the version 6.6 (or later) of the ROM's for best performance, although it will work with older versions. If you are unsure, have your local Commodore Service Center check your ROM version, and order an upgrade if needed.

- The older Commodore A2090 and A2090A Controllers are not supported by the Fusion-Forty. There are various problems with these cards in general, and many manufactures suggest upgrading.

- The GVP series II controllers work fine except that it takes a little while to boot, but after that the performances are good. It seems that many accelerators have this problem with this controller, but it is a very minor problem since it affects only the boot timing. If you have a GVP Memory / Drive card, with memory on it, you must have the latest version of the GVP ROMS for the RAM to function properly.

- The DMA only to chip ram prefrence on some controlers increase the speed of the drive. (The A2091 Works faster in this mode.)

- If you are using a Supra controller with the new "Word Synch" capability, you will experience a tremendous speed increase since this controller is non-DMA and depends on the CPU speed for transfers. It is considered a good speed controller on a regular A2000 Amiga, but it becomes the fastest on the market with our board!

We recommend it (the Supra controller) highly since it offers the best performance known to us with our board. It is almost as fast as the Amiga 3000 hard disk, whitch is quite a feat.

- The Trumpcard Professional series also seems to have very good performance with our board.

Once again we give you this information, and we hope you will understand that 68040 boards are very new products. All hardware manufacturers will have to adjust to the 68040, since many third party hardware products did not have a 68040 available at the time they developed their product(s). It is then normal they could not try their hardware product(s). Please let us know if you experience any hardware compatibility problem with your Fusion-Forty; we will promptly find a solution. All problems encountered to date were cured with a minor software change, that did not involved any hardware change at all!

SOFTWARE CONSIDERATIONS

The software compatibility is nearly 100%, the only programs not working are the same that are not working on a 68030 accelerator. (most are games that you can run in 68000 mode)

- The 68040 is the actual top of the line of the 68000 CPU family, it includes a FPU (Floating Point Unit) and a MMU (Memory Management Unit), it also has a 4KB data cache and a 4KB instruction cache.

- The MMU is different than the external one for the 68030, so you have to be cautious in using software developed for the 68030 MMU. The 68040 MMU allows remaping only in 4K and 8K pages. Please note that this is very different from 68851 or the onchip MMU of the 68030 which allows mapping within ranges from 256bytes to 32Kbytes. Therefore one should not expect any program that uses MMU code for the 68030 or the 68851 to operate correctly. For example avoid the use of the "setcpu" program in your startup-sequence or you will experience a software error. Fortunately it seems to be the only program around that cause some problems, the Fusion-Forty software provides an equivalent to "setcpu" so that you can enjoy the speed increase gained by moving the Amiga ROM's into the 68040 fast 32 bit memory.

- The FPU is also different, but it should not cause any crashes; the only problem in this case is that some programs do not detect the 68040 FPU and think they have only integers operations available. If you have a product experiencing this problem, let us know and we will provide an easy fix for the company producing the software, so that you can enjoy the speed of your 68040 FPU.

- Avoid programs like VirusX and some public domain screen blanker's that uses CPU time since they will slow down your programs and disk operations, VirusX is known to recognize viruses when there are none and also causes many software problems even on non accelerated Amiga's.

- Because AmigaDOS 1.3 was written before any knowledge of the 68040 CPU, it could not anticipate it's new functionality, many of the programs provided with your Fusion-Forty are there to give better compatibility with the 1.3 version of AmigaDOS. When you run the cache control program it opens a window allowing you to enable or disable the different cache options as you wish. For an explanation of the precautions to take when using AmigaDOS 1.3 refer to the Cache Control Section of this manual.

- Up to now we haven't found any program having a problem with the Fusion-Forty. Most problems are related to the broken barrier of 9MB of memory and can easily be fixed, the others are the same that have problems with a 68030 accelerator and they are usually games; so you can still play them in the 68000 mode. (See Enable/Disable 68040 mode section)

BENCHMARKS: Be very cautious when you are running benchmark programs since your hardware configuration might have a great importance (Disk controller, memory, genlock, overscan, etc.).

Also you should not always blindly believe the numbers you obtain from the tests: a famous one is the "diskspeed" program saying that a GVP series II on an Amiga 2000 is faster than the Amiga 3000 controller, the GVP series II is a very good controller but the one on the Amiga 3000 is definitely faster.

The best benchmark is still to try the applications you wish to use on your Fusion-Forty board.

Keep in mind that there is not yet a program optimized for the 68040 CPU.

THEORY OF OPERATION

The FUSION-FORTY is a single board computer based upon the Motorola 68040.

RCS Management uses the Amiga 2000 as a high performance and extremely intelligent I/O subsystem.

The Amiga 2000 comprises all necessary controls to aid the FUSION-FORTY as follows:

1) Floppy Disk with optional Hard Disk interface.

2) An extremely capable and intelligent graphics sub-system.

3) Serial, Parallel ports

4) Excellent Networking capabilities (as provided by RCS Management)

5) A Zorro II bus.

6) Above all, a modern, modular, message passing, object orientated operating system that RCS can inherit.

The FUSION-FORTY may be viewed as a simple microprocessor based computer with up to 32 MegaBytes of RAM and as a Zorro II bus adapter.

The FUSION-FORTY communicates with its on board memory at 25Mhz with a 32bit synchronous bus. The FUSION-FORTY communicates with the Amiga 2000 I/O subsystem through the ZorroII bus at 7Mhz with 16bit asynchronous access. The keen reader will realize that the 68040 is a 32 bit synchronous only based microprocessor and that the FUSION-FORTY meets this requirement. Also because of the Amigas graphic capabilities one will also realize that certain devices on the Amiga 2000 will change the Amiga 2000 internal clock. Therefore for reliable operation the FUSION-FORTY must communicate with the Amiga 2000 in an asynchronous fashion.

The fusing of these operations has lead to the name FUSION-FORTY.

If this is all too much for you then we at RCS encourage you to look at the FUSION-FORTY as a massive performance enhancement for your Amiga 2000.

QUESTIONS & ANSWERS

My machine will not boot, what should I do?

If this happens you probably have a hardware incompatibility, check that your Fusion-Forty card is solidly in it's slot, if it still does not work you should see if it works in the 68000 mode.
If it fails please remove any hardware accessories except your Fusion-Forty board and try again, if it does not work you should consult the Technical Support section.
If it did work, it means one of the other add on is in conflict with our board, see the Hardware Considerations section and the Technical Support section if needed.

My machine boots but crashes during the startup-sequence?

Take note of the exact line where the startup-sequence fails, check the Software Considerations section. If problems persist, try to re-install the Fusion-Forty software. See Software Installation section.
If you still have the problem then see the Technical Support section.

Everything works fine but it is not as fast as it should be?

Have you run the cache control utility with your Fusion-Forty, be sure that all the caches and the copyback mode are ON, do not forget that you must not close the cache control window or you will be back to the slowest mode (still quite fast) of your Fusion-Forty. We suggest that you leave the cache control program running at all times.

TECHNICAL SUPPORT

Before calling our technical support, please be sure that you know how to reproduce the problem. Take the time to fill out the TECHNICAL PROBLEM form. This will save time when you call and will also help us to promptly find an answer to your problem.

For technical support, please call the following numbers between 9:00 AM and 5:00 PM E.S.T.

TEL :519-436-0988, if busy call 514-871-4924
FAX :519-351-1334

(If possible Fax in your TECHNICAL PROBLEM form Prior to calling)

SUPPORT BBS

The RCS Management support conference will contain information on new products for the Fusion-Forty, Question & Answer messages, hints and tips, and upgrade information.

New versions of the Fusion-Forty software, and manual updates may be downloaded upon first call.

Ray's Tracing Place, 24Hr, 1200-38400 Baud supported.

BBS: 519-436-0140

TECHNICAL SPECIFICATIONS

Fusion-Forty card

.microprocessor : Motorola 60840 at 25 MHz

.sockets for 32M of 32-bit RAM.
1M x 8bit (Page Mode) DRAM 80ns or faster
4M x 8bit (Page Mode) DRAM 80ns or faster

.heat sink to dissipate heat from the microprocessor.

.hardware switch to disable/enable 68040 mode.

.oscillator : 50 MHz

.burst mode (ON, Hardware selectable only)

.external power supply connector (the board may be powered by an external power supply if necessary).

.three expansion connectors are put on the board for future expansion.

.6 layer board with separate ground and power planes.

WARNING: *The Fusion-Forty may not be modified in any way except for RAM upgrades. RAM installation should be performed only by an authorized service personnel.*

WARRANTY

With respect to the Fusion-Forty board and the physical diskette and the physical documentation enclosed, RCS MANAGEMENT warrants the same to be free of defects in materials and workmanship for a period of one year from the date of purchase. In the event of notification within the warranty period of defects in material or workmanship, RCS MANAGEMENT, at its sole option, shall replace or repair the defective portion of the Fusion-Forty board, the diskette or documentation.

To process any warranty claims, complete the "Warranty Registration" card and return, with the proof of purchase, to the posted address before the warranty period has expired. The warranty holder must then telephone the Technical Support line or local dealer to be further instructed as to the disposition of the defective material and how to properly apply for a warranty claim.

All Warranties will be void if any changes to the Fusion-Forty board or software are not performed by authorized service personnel. Local dealers should have such authorization.

Other warranties, either expressed or implied, will not be binding on RCS MANAGEMENT, its Employees or affiliated companies.

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GLOSSARY

CPU:
Centeral Processing Unit, The brains of the Amiga

DRAM:
Dynamic Random Access Memory, Temporary information (Programs, Data, etc.) storage.

FPU:
Floating Point Unit, a special processor for math.

MB:
Mega Byte, a unit of measure. Think of it as 1,048,576 printed letters.

NS:
Nano Second, a minute measure of time.

ROM:
Read Only Memory, a chip that stores information permanently, and cannot be changed.

SCSI:
Small Computer Standard Interface Controller,

SIMM:
Single Inline Memory Module.